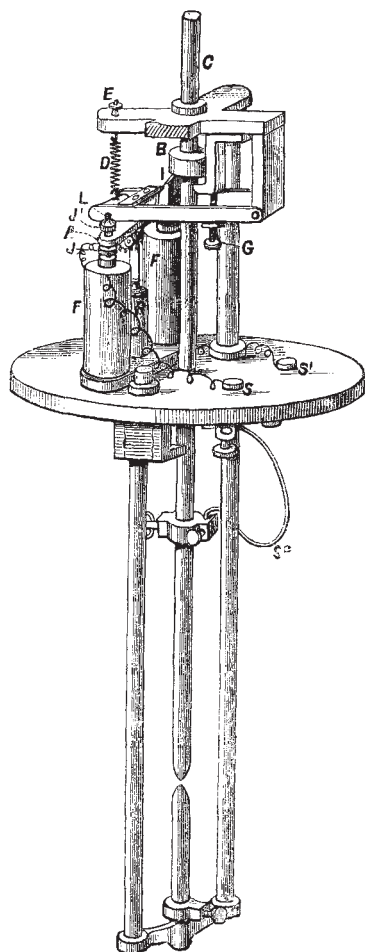


found favour with the public are the well-known inventions of Brush and Weston. Though the clutch device is in itself simple and efficient, the difficulty which has beset the action of such lamps has been that of arranging suitable electric mechanism to work the clutch. In Hart's lamp an electro-magnet through the coils of which the main current passed on its way to the lamp, lifted the clutch, and again released it when the increasing resistance of the arc interfered with the strength of the current. In the lamps of Weston and of Brush a much more complicated arrangement was adopted, the magnets which worked the clutch being in both these patterns of lamp wound "differentially," that is to say, with a coil of fine wire connected as a shunt to the lamp, acting in opposition to another coil of thick wire through which the



main current flowed. This differential principle was originally applied in the Siemens' lamp, wherein, however, no clutch was used. In the Pilsen lamp, and in many others, combinations of shunt magnets and main-circuit magnets have been similarly applied. The lamp which we illustrate in the figure, the invention of Mr. Charles Lever, of Manchester, is a clutch lamp, but of remarkably simple, yet efficient construction. And as it possesses sundry points worthy of notice from a scientific aspect, we will briefly describe it. The upper carbon is clamped in a holder or carbon rod C, which consists of a tube of brass sliding smoothly through the upper framework of the lamp. Fitting accurately, but not tightly to it, is a brass washer, or collar, B, which is supported from below or on one side by an adjustable screw, G, and on the other by a metal piece, I, projecting from the jointed framework

below. This framework is held up by a spiral spring, D, which, when the lamp is not in action, keeps the piece, I, pressed up under the washer, B, and tilts it. When thus tilted it clutches the carbon-holder, C, and raises it. Attached to the under-side of the jointed framework alluded to is an iron bar, A, bearing two broad-ended iron screws, J, below which, again, are seen the two limbs of an electro-magnet, FF, with the poles upward. This electro-magnet is wound with fine wire, and connected as a shunt to the lamp. Now, as described above, when the lamp is not in action, the carbons are held apart by a spring. When the current is turned on it must therefore pass through the shunt magnet, which immediately attracts the bar, A, lowers the piece, I, releases the clutch-washer, B. The upper carbon then falls, and the current is diverted from the shunt-magnet to the lamp itself, passing through the carbons. But when this takes place, the spring, D, being no longer opposed, draws up the framework, and picks up the clutch, thus raising the upper carbon through the space requisite for the production of the arc. A more simple or efficient mechanism would be difficult to devise; and its action is extremely regular and steady in practice.

NOTES

PROF. HUXLEY has been appointed to deliver the Rede Lecture (Cambridge) this year.

MR. G. H. DARWIN, M.A., F.R.S., has been elected to the Plumian Professorship of Astronomy and Experimental Philosophy at the University of Cambridge, vacant by the death of the Rev. James Challis. This was the first election to a professorship since the approval of the new University Statutes by Her Majesty in Council. By the new statutes the election to certain professorships is vested in a Board nominated by the Special and General Boards of Studies and by the Council of the Senate, the persons so nominated being elected by the Senate. The members of the Board appointed to elect to the Plumian Professorship are the Vice-Chancellor, Prof. H. J. S. Smith, of Oxford, Mr. W. H. M. Christie, the Astronomer-Royal, Mr. W. Spottiswoode, President of the Royal Society; Professors Adams, Stokes, Cayley; Dr. Ferrers, Master of Gonville and Caius; and Mr. Isaac Todhunter, of St. John's.

THE subscription for the Darwin Memorial has awakened so much enthusiasm in Sweden that the local committee there formed has received subscriptions from no less than 1400 persons, including "all sorts of people," writes Prof. Loven in a letter to the English Committee, "from the bishop to the seamstress," the sums varying from five pounds to twopence. The English Committee, which has its head-quarters at the Royal Society, London, has now received (inclusive of subscriptions from abroad), 4000*l.*, but the number of subscribers in the United Kingdom is only about 600. From this it would seem that an interest in science is not nearly so widely spread in Britain as it is in the more thinly peopled land of Sweden.

IN announcing the death of Mr. Darwin to the American Philosophical Society at its meeting on April 21, 1882, Dr. Le Conte stated the general bearing of Darwinism in a striking and unusual way:—"To no man more than to Darwin does the present age owe as much, for the gradual reception of the modern method of close observation over the scholastic or *a priori* formulæ, which, up to a brief period, affected all biological investigations. To him, above all men, we owe the recurrence to the old Aryan doctrine of evolution (though in those ancient times promulgated under the guise of inspiration) as preferable, by reasonable demonstration, to the Semitic views, which have prevailed to within a few years, and are still acceptable to a large number of well-minded but unthinking men. The doctrine

of evolution, in its elementary form, means nothing more than that everything that exists has been derived from something that pre-existed; that the former is related to the latter as effect is to cause. And it is most pleasing evidence of the acceptability of this doctrine, that it is now heard from many pulpits in the land, and is a strong illustration of the instructions which are thence given."

LETTERS have been received from Mr. Forbes dated from Shonga, on the Niger, at the end of October last. Shonga is a small trading-station a short distance up a creek on the right bank of the main stream some fifty miles below Rebba. Mr. Forbes had been there three weeks, and was expecting to remain about three more, when the steamer would call for him, and try to get up to Sokoto—an excursion that would occupy at least six weeks. After this Mr. Forbes would return direct to England. Having been pulled down by fever and the want of good food, Mr. Forbes had not been very successful in his collections at Shonga. His list of species of birds obtained at the date of his letter was only 105, and the difficulty in obtaining spirit had interfered with the preservation of fishes, of which many species were abundant.

In a collection of birds and insects just received from Mr. Andrew Goldie by Messrs. Salvin and Godman are specimens of a fine new Bird of Paradise, obtained in the D'Entrecasteaux Islands, south-east of New Guinea. This species, which belongs to the restricted genus *Paradisea*, is shortly characterised by Messrs. Salvin and Godman in the last number of the *Ibis* as *Paradisea decora*, and will be fully described and figured in the next number of the same journal.

THE *Lancet* is happy to be assured that the rumours respecting the infirm state of health of Prof. Owen are unfounded. The large circle of the professor's friends will share with us in the hope that his valuable life will be prolonged many years beyond the seventy-nine which it has already reached.

A GROWING want has for some time been felt by lecturers on biological subjects, and especially by those whose lot it is to address large audiences or classes, of a good series of lantern slides, which would do for biology what has been so well done for physical science by York's series of slides. The ever increasing use of the oxyhydrogen lantern as a means of illustration, especially with popular audiences, renders this need more apparent. Arrangements have, however, now been made with Messrs. York and Son, 87, Lancaster Road, Notting Hill, London, W., to issue such a series, under the supervision of Dr. Andrew Wilson and of Mr. Wm. Lant Carpenter, to whom, at 36, Craven Park, Harlesden, London, N.W., or to Dr. Wilson, 110, Gilmore Place, Edinburgh, any communications on the subject may be addressed. It is intended that, in the first instance, the series shall comprise some of the principal types and life-histories of the lower forms of plant and animal life, and the elementary facts of animal and vegetable physiology. It is believed that the knowledge that these are in preparation, may save the construction of diagrams by some lecturers, and may lead others to make valuable suggestions as to sources of illustration, &c., to one of the above named gentlemen.

PROF. COOK, of Canterbury College, New Zealand, points out in the new number of the *N.Z. Journal of Science* that while the colony is remarkably well provided with museums, it is entirely without a public astronomical observatory. It is a fact that some years ago about 250*l.* were collected for such an observatory, but it came to nothing. We heartily endorse Prof. Cook's able advocacy for the foundation of an observatory in New Zealand, which, if perfectly equipped and directed could not fail to do good work. Out of a total of ninety-five observatories in the *Nautical Almanac* only eight are in the southern latitudes.

AT the Guildhall last week Dr. Siemens and Dr. Percy were each presented with the freedom and Livery of the Worshipful Company of Turners. The honour was conferred upon Dr. Siemens in recognition of his eminence as an engineer, his successful application of physical science to valuable practical purposes, especially electricity and metallurgy, and his personal support of technical education. The new member made a suitable reply in returning thanks for the honour conferred on him, an honour which was specially precious to him, and of which he should ever be proud. Referring to electricity, he said it was a new science, the applications of which had all to be developed, and in the development of which wonderful results had been produced. In the case of Dr. Percy, the honour was conferred in recognition of his distinguished scientific attainments, especially in connection with metallurgy, the great value of his researches, and his teaching not only to turners, but to all workers in metal.

THE German Fishery Society has petitioned the Reichstag to make a grant of 10,000 marks, chiefly to enable Germans to take part in the approaching London Fishery Exhibition. It is desired that an official delegate should represent this Empire in London in connection with the enterprise.

THE astronomical observatories of Greenwich, Kiel, Pulkova, Vienna, Milan, Paris, Utrecht, and Copenhagen have fixed on Kiel as the centre for astronomical telegrams. For an annual payment of five pounds each of the above-mentioned observatories will receive by telegraph information of every fresh astronomical discovery wherever made.

DR. SCHLIEMANN is desirous of commencing a new series of excavations in the North-West of Athens. In the neighbourhood of the old Academy was the site of the official burial-ground, and there were buried the ancient Athenians who had fallen in battle. Dr. Schliemann hopes in this spot to find the grave of Pericles. At a subsequent period it is his intention to begin fresh excavations in Crete.

IN an address on education at Birmingham on Monday, Mr. Mundella said: "They were asked if they were not over educating; he said no, and he would tell them why. Our idea of education was the lowest, certainly, on this side the Alps. Those who had the longest experience in education, those nations which had spent the most on it, were at this moment making the greatest efforts. The educational impulse throughout Europe was something they could hardly believe, and it was so because the people on the Continent had found that knowledge was power, not only military power, but industrial power. Whereas in Birmingham, last year, the expenditure on education was 2*s.* 3*d.* per head, in Paris it was 12*s.*"

THE following gentlemen have kindly promised to deliver popular lectures, with lantern illustrations, at the Royal Victoria Coffee Hall, Waterloo Road, on Friday evenings at 9 o'clock. January 19, Mr. Wm. Lant Carpenter, B.A., F.C.S., on "The Telephone and how to talk to a man 100 miles away." January 26, Mr. C. A. V. Conybeare on Pompeii. On February 2, instead of a lecture a magic lantern entertainment, entitled "Here, There, and Everywhere," will be given by Major George Verney. February 9, Mr. E. B. Knobel (Sec. R.A.S.), "The Sun and his Family, with a glance at other Suns."

ACCORDING to the *Journal* of the Russian Physico-chemical Society, the priority in photographing with the electric light belongs to the well-known St. Petersburg photographer, M. Lewitski, who obtained such photographs in the winter of 1856, on the following occasion:—To produce the electric light during the celebration of the coronation of the Czar Alexander II. at Moscow, a Bunsen battery of 800 elements had been constructed.

The following winter this battery was taken to St. Petersburg, and Prof. Lenz demonstrated its action to a distinguished auditory, formed of members of the Imperial family and generals of the army. It was during this lecture that M. Lewitski obtained a photograph of the professor. A positive of this portrait was presented by M. Lermantoff to the Russian Physical Society at the *séance* on December 14, 1880. It is by no means a poor photograph, but full of detail in the shadows and half tints.

IN a recent report of the Berlin Physical Society (p. 95) we referred to some valuable observations by Dr. Koenig with Prof. Helmholtz's new instrument, called the *leukoscope*. We observe that a detailed account (with illustration) of the instrument and of the results obtained with it, appears in *Wiedemann's Annalen*, Nos. 12 and 13 of last year.

PROF. F. W. PUTNAM has concluded a very successful course of lectures at the Peabody Museum, Boston, on some of the most interesting of American antiquities. The *Boston Evening Transcript* in an article on the lectures says:—"It is to be hoped that the curator will not again be retarded in his work from the want of means for its prosecution, when he has shown, as he has in this course of lectures, how much can be done at comparatively little expense under proper methods of research. As he said in his lecture, what is to be done must be done at once, and it would be a great pity to have the opportunities now open to him lost to science. The ancient city known to the present inhabitants of the Little Miami Valley, thirty-five miles east of Cincinnati, as 'Fort Ancient,' would be worth to American scholars for study as much as any of the old Greek cities that have been so thoroughly dug over by European explorers and students. Certainly American scholars should lead in American archæology and ethnology. The restoration or preservation of these wonderful remains of a comparatively enlightened prehistoric American people would be a glorious monument for any American Institution of learning and science."

SHOCKS of earthquake have been felt in the province of Murcia, in Spain. Seven shocks occurred at Archena on the 11th inst. Shocks have also been felt at Fortuna, Muta, Ricotel and other towns in Murcia. Eleven distinct shocks were felt on Tuesday morning at Archena, between the hours of three and six. Some lasted fifteen, and others lasted two seconds. An earthquake of a few seconds duration was experienced at Kultorp, near Kalmar, in Sweden, at 8.50 p.m. on the 12th inst. A slight shock of earthquake was felt at Monmouth at five o'clock on Tuesday evening, accompanied by a light, rushing noise. The wave seemed to pass from south-east to north-west.

A REMARKABLE discovery of the elder *Runic* inscriptions has just been made in Ryfylke in Norway. The characters have been made on a stone, the arrival of which in Christiania is awaited with great interest by *servants*.

THE French Minister of Postal Telegraphy in France has established at the central office a special course of lectures on Wheatstone's automatic apparatus, to which sixteen competent operators, from different parts of the country, have been admitted. The course of lectures and experiments has lasted two months. The pupils are now passing an examination, and a special certificate will be issued to the successful candidates, which will greatly help them in their future promotion in the postal telegraphic service.

THE Parc Montceau, placed in one of the most fashionable parts of Paris is now lighted by Jablochhoff candles with success.

ADMIRAL MOUCHEZ has issued his invitation for the *Soirées* de l'Observatoire, at which as usual will be exhibited all the scientific novelties of the year.

M. CHEVREUL has been unanimously nominated once more President of the French *Société Nationale d'Agriculture*.

IT is expected that the French Government will take in hand the celebration of the centenary of the discovery of balloons. The two committees which had been formed by several aeronautical societies have been amalgamated, and M. Gaston Tissandier has been appointed president. The scheme of an international exhibition for balloons and instruments used in aerial investigations has been adopted by M. Herrisson, the Minister of Public Works, and will be carried into effect by M. Armengaud Jeane, the well-known civil engineer.

IN his speech on laying down his office, previous to being admitted Vice-Chancellor for the year 1883, Dr. Porter, Master of Peterhouse, Cambridge, referred to the endowments of the new Professorships of Physiology and Pathology, increased grants to the museums and lecture-rooms, and a chemical laboratory on an adequate scale, as among the more urgent claims on the new funds available to the University.

PROF. FRISBY writes from the U.S. Naval Observatory, Washington, that in the circular he lately sent (*NATURE*, vol. xxvii. p. 226), giving elliptic orbit of great comet, $\phi = 89^{\circ} 7' 42'' \cdot 70$ should be $\phi = 89^{\circ} 13' 42'' \cdot 70$.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus radiatus* δ) from India, presented by Mr. C. James; a Common Otter (*Lutra vulgaris*), British, presented by Mr. E. P. Squarey; a Black-necked Hare (*Lepus nigricollis* δ) from Ceylon, presented by Mr. W. Bowden Smith; an Indian Antelope (*Antelope cervicapra*) from India, presented by Capt. R. Brooke Hunt; a Bohor Antelope (*Cervicapra bohor* η) from India, presented by Mr. W. J. Evelyn; a Black-backed Jackal (*Canis mesomelas*) from South Africa, presented by Mr. J. S. Crow; a Larger Hill Mynah (*Gracula intermedia*) from India, presented by Mrs. M. R. Manuel; three Passenger Pigeons (*Ectopistes migratorius*) from North America, presented by Mr. F. J. Thompson; a — Horned Lizard (*Phrynosoma* —) from California, presented by Mr. Martin R. de Selincourt; a Common Adder (*Vipera berus*), British, presented by Mr. J. Harris; an Indian Black Cuckoo (*Eudynamis orientalis*) from India, purchased; an Axis Deer (*Cervus axis* δ), born in the Gardens.

APPROXIMATIVE PHOTOMETRIC MEASUREMENTS OF SUN, MOON, CLOUDY SKY, AND ELECTRIC AND OTHER ARTIFICIAL LIGHTS¹

SIR WILLIAM THOMSON pointed out that the light and heat perceived in the radiations from hot bodies were but the different modes in which the energy of vibration induced by the heat was conveyed to our consciousness. A hot kettle; red-hot iron; incandescent iron, platinum, or carbon, the incandescence in the electric arc, all radiate energy in the same manner, and according as it is perceived through the sense of sight, by its organ the eye, or by the sense of heat,² we speak of it as light or heat. When the period of vibration is longer than one four-hundred-million-millionth of a second, the radiation can only be perceived by the sense of heat; when the period of vibration is

¹ Abstract of lecture at the Glasgow Philosophical Society, by Sir William Thomson, F.R.S.

² Sometimes wrongly called the sense of touch. The true list of the senses, first given, I believe, by Dr. Thos. Reid, makes two of what used to be called the sense of touch, so that, instead of the still too common wrong-reckoning of five senses, we have six, as follows:—

Sense of Force.
„ Heat.
„ Sound.
„ Light.
„ Taste.
„ Smell.